Forces of Change

Technology

Exploratory Scenario Report

Southwestern Pennsylvania Commission
Forces of Change Exploratory Scenario Reports
January 2019
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What Are Forces of Change?
Forces of Change are a wide range of global and national trends that could affect Southwestern Pennsylvania now and in the future.

What Are Forces of Change?
The Southwestern Pennsylvania Commission (SPC) is creating a new regional plan in which it will consider major Forces of Change and how we can best take advantage of opportunities they may create and mitigate the disruptions they may cause. Forces of Change are high level external forces (global, national, regional) that could have significant regional impacts (both positive and/or negative) now and in the future.

A Force of Change Scenario Report for each category has been developed by SPC. The reports will be used, along with input from the public, to establish a range of potential strategies related to each Force of Change. These strategies were reviewed and discussed at a Regional Plan Workshop held in September 2018. The resulting list of strategies will be used to gather further public input and ultimately to update the long range plan for the Southwestern Pennsylvania region.

SPC has identified forces that have effects on transportation and development in five broad categories: Demographics, Technology, Economy, Environment, and Funding.

Why and How Were Forces of Change Identified?
Every four years, SPC is required by federal law to update the region’s long range transportation plan. This plan lays out the vision and strategies for transportation investments in the Southwestern Pennsylvania region over the next 25 years. The current plan was adopted in June 2015.

In 2017, SPC staff began working with the region’s planning directors to develop a Task Force to help develop a process for the new long range plan.

SPC began by reviewing publications from the National Cooperative Highway Research Program on “Dynamic Forces of Change.” Next, peer Metropolitan Planning Organizations (MPOs) along with national and regional thought leaders were interviewed to get different perspectives. Common themes emerged, which drove the formation of Expert Resource Panels for each of the five categories to identify the Forces of Change that will impact them.
Expert Resource Panels and Exploratory Scenarios

Expert Resource Panels were formed to provide expertise on the potential effects of Forces of Change on the region. The Expert Resource Panels identified the Forces of Change within each category that are likely to impact the region. Panelists discussed potential opportunities and challenges, the relative probability of occurrence, and whether the impacts will be positive or negative.

The panel activities were designed to help answer the following questions:

What significant trends or disruptions are occurring now, or are foreseen to occur, with potential impact for the region?

Will the impacts be positive or negative for the region?

What specific challenges and opportunities for the region are generated by these occurrences?

What is the anticipated magnitude of the identified challenges and opportunities?

Participants were asked to focus on events, trends, and factors within each category and to identify possible impacts, potential challenges, and opportunities for each Force of Change.

Based on that discussion, exploratory scenarios were developed. Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. These were developed to aid in discussions related to impacts and strategies for moving forward successfully.

Below are some of the topics that were explored by the Expert Resource Panels. Panelists considered the regional impacts of the topics and identified additional avenues for investigation.

Demographics
Aging Population and Labor Force; Immigration (regional); Urban and Suburban Development Patterns; National/Regional Shifts; Household Size; Diversity; Education; and, Opioid Addiction.

Technology
Connected & Autonomous Vehicles; Mobility as a Service; Automation; Additive Manufacturing; Modal Impacts; Broadband; and, Artificial Intelligence.

Economy
Emerging Industries; Housing Affordability; Economic Growth; Household Income; Employment Types; Shared Economy; Online Economy vs. Brick and Mortar Retail; and, Decaying Infrastructure.

Environment
Energy Supply and Demand; Fossil Fuel/Renewable Balance; Security; Environmental Attitudes; Climate Change and Resilience; and, Water Quality.

Funding
Role of Public & Private Sectors; Investment Levels; National/State/Local Government Roles; and, Finance (how to pay).
What Are The Technology Forces of Change?
Technology Forces of Change

Broadband

The provision of broadband internet service throughout the Southwestern Pennsylvania region is critical to our economy and our children’s education. According to the Federal Communications Commission’s 2016 Broadband Progress Report, Fayette, Greene and Indiana Counties are three of thirty-four counties across the state that have less broadband access than the national average.

Increased access to broadband could impact rural development, telecommuting, and infrastructure. Next generation 5G broadband services require small cell installations that are more closely spaced than the current tower installations, which creates a potential land use dilemma as well as implementation challenges.

Standards are still emerging and will continue to evolve as technology advances. Regional assessments will be required in order to determine the threshold of service needed by public and private uses. Public/private partnerships will be crucial in the development and implementation of broadband installation.

The recently-launched Pennsylvania Broadband Initiative is a dedicated effort to provide high speed internet access to every household and business in the state. This effort includes a dedicated office to manage the effort, and a Broadband Investment Incentive Program, which offers $35 million of financial incentives to private providers bidding on service areas in the FCC Connect America Fund Phase II Auction. The FCC Auction uses a competitive bidding process to award nearly $2 billion of subsidies to providers. This could potentially transform the landscape of rural broadband internet in Pennsylvania.

% Population with Broadband by County

<table>
<thead>
<tr>
<th>County</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegheny County</td>
<td>99%</td>
</tr>
<tr>
<td>Westmoreland County</td>
<td>97%</td>
</tr>
<tr>
<td>Beaver County</td>
<td>97%</td>
</tr>
<tr>
<td>Butler County</td>
<td>96%</td>
</tr>
<tr>
<td>Lawrence County</td>
<td>95%</td>
</tr>
<tr>
<td>Armstrong County</td>
<td>94%</td>
</tr>
<tr>
<td>Washington County</td>
<td>91%</td>
</tr>
<tr>
<td>Greene County</td>
<td>88%</td>
</tr>
<tr>
<td>Fayette County</td>
<td>88%</td>
</tr>
<tr>
<td>Indiana County</td>
<td>77%</td>
</tr>
</tbody>
</table>

SOURCE: Federal Communications Commission
Autonomous/Connected Vehicles

Self-driving vehicles could impact safety, infrastructure, traffic, land use, and workforce. Furthermore, self-driving cars have the potential to change everything from the need to own a private vehicle, to the way we move freight, the way we pay for infrastructure, and the way we plan for development.

The private sector will most likely drive this technology and create user demand and expectations. The public sector will need to keep pace with technology advancements, which may drive funding and investment priorities. For example, if these vehicles result in more congestion and maintenance of our current infrastructure, then revenue based on vehicles miles traveled and congestion pricing measures could be considered.

Autonomous/connected vehicles (AV/CV) will rely on public sector coordination, including policy setting, infrastructure development, and land use controls (drop off zones, curb management, etc.). Coordination between the private sector and local and regional public entities will be crucial in ushering widespread use of AV/CV while ensuring the safety of all road users.

Local municipalities must also ensure current and future investment is adaptable to changes in transportation and land use regulations. For example, the region must plan for adaptable reuse of existing and future parking structures if they become obsolete due to AV/CV technology.

The region is already a leader in the autonomous vehicle field, in large part due to the region’s large number of engineering graduates, many of whom come from the robotics and engineering programs at Carnegie Mellon University and the University of Pittsburgh. Per the Allegheny Conference’s Inflection Point 2017-2018 report, the year-over-year growth of the autonomous vehicle field was 324%, which topped all other regions.

Year Over Year Growth in Job Openings Related to Autonomous Vehicles

<table>
<thead>
<tr>
<th>Location</th>
<th>Growth in Autonomous Vehicles-Related Job Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pittsburgh</td>
<td>324%</td>
</tr>
<tr>
<td>San Francisco</td>
<td>228%</td>
</tr>
<tr>
<td>San Jose</td>
<td>70%</td>
</tr>
<tr>
<td>Detroit</td>
<td>61%</td>
</tr>
<tr>
<td>US Overall</td>
<td>54%</td>
</tr>
</tbody>
</table>

SOURCE: Inflection Point 2017-2018, Allegheny Conference on Community Development
Mobility as a Service

Transportation Network Companies (such as Uber and Lyft) may change the way we travel and may reduce individual vehicle ownership. Other new transportation technologies and opportunities, such as Mobility as a Service, micro-mobility (HealthyRide bike share; Scoobi e-scooters) or micro-transit (RideACTA Shuttle), have the potential to reduce congestion, improve the region’s air quality, connect people with jobs throughout the region, and provide equitable access to transportation to all communities in the region.

Uber recently launched Uber Movement in Pittsburgh, which provides anonymized traffic data from information collected on Uber trips in the region. The aggregate data collected by Uber Movement can help cities make informed decisions about how to adapt existing infrastructure and invest in future solutions to make a region more efficient.

Funding for mobility remains an issue for both private and public entities. Cost is the largest deterrent to creating a sustainable system. Credit vouchers for ride-sharing services could be implemented to expand current public transit routes and incentivize riders to consider other forms of public/private transportation.

All service providers should be working and coordinating with transit agencies and local municipalities to potential address service gaps in the system.
Additive Manufacturing

Additive manufacturing, also known as “3D printing,” can lead to efficiency, competitiveness, workforce development, and supply chain impacts. Additive manufacturing has the potential to reshape the industry through rapid prototyping, faster time-to-market, and distributed manufacturing capabilities.

The City of Pittsburgh and its surrounding areas have emerged as a leader in this field, which is shown in the year-over-year growth in additive manufacturing job demand. With 128% year-over-year growth, Pittsburgh is the nation’s fastest-growing major metropolitan area for job openings related to additive manufacturing.

As additive manufacturing grows in the region, it will require training. Employers and universities should work together to ensure workers receive the training they need so that the region remains competitive in this fast-growing field.

2017-2018 Year-Over-Year Growth in Job Openings Related to Additive Manufacturing

<table>
<thead>
<tr>
<th>Location</th>
<th>Growth in Additive Manufacturing-Related Job Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pittsburgh</td>
<td>128%</td>
</tr>
<tr>
<td>US Overall</td>
<td>9%</td>
</tr>
</tbody>
</table>

SOURCE: Inflection Point 2017-2018, Allegheny Conference on Community Development
Artificial Intelligence

Use of robotics has the potential to increase efficiency, impact jobs, and shift the local culture. Due to technological advancements over the past 20 years, the way we communicate with one another, and shop for goods and services are all changing rapidly.

As technology advances so will the skills employees will need, thus calling for continuous upskilling of the incumbent workforce. Even as demand for these skills increases, there are new concerns about the impacts of automation. However, some believe workers may actually have greater employment opportunities as routine tasks become automated, as long as they are able to learn how to use these new technology-based tools.

An Allegheny Conference report examined the risk automation poses to various fields, and is illustrated in the chart to the right. Positions such as registered nurses, nursing assistants, and software developers face little risk of automation, while occupations such as retail salespersons and pharmacy technicians among others are at the greatest risk of automation.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Risk of Automation</th>
<th>Total Employment in Pittsburgh MSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td>Low</td>
<td>30,810</td>
</tr>
<tr>
<td>Nursing Assistants</td>
<td>Low</td>
<td>13,590</td>
</tr>
<tr>
<td>Software Developers, Applications</td>
<td>Low</td>
<td>7,920</td>
</tr>
<tr>
<td>Medical Assistants</td>
<td>Low</td>
<td>6,130</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>Low</td>
<td>5,790</td>
</tr>
<tr>
<td>Management Analysts</td>
<td>Low</td>
<td>4,880</td>
</tr>
<tr>
<td>First-Line Supervisors of Construction Trades and Extraction Workers</td>
<td>Low</td>
<td>4,380</td>
</tr>
<tr>
<td>Electricians</td>
<td>Low</td>
<td>4,060</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>Low</td>
<td>3,420</td>
</tr>
<tr>
<td>First-Line Supervisors of Mechanics, Installers, and Repairers</td>
<td>Low</td>
<td>3,310</td>
</tr>
<tr>
<td>Customer Service Representatives</td>
<td>Medium</td>
<td>23,310</td>
</tr>
<tr>
<td>Heavy and Tractor-Trailer Truck Drivers</td>
<td>Medium</td>
<td>13,360</td>
</tr>
<tr>
<td>Maintenance and Repair Workers, General</td>
<td>Medium</td>
<td>10,810</td>
</tr>
<tr>
<td>Carpenters</td>
<td>Medium</td>
<td>7,340</td>
</tr>
<tr>
<td>Automotive Service Technicians and Mechanics</td>
<td>Medium</td>
<td>6,220</td>
</tr>
<tr>
<td>Computer User Support Specialists</td>
<td>Medium</td>
<td>5,950</td>
</tr>
<tr>
<td>Market Research Analysts and Marketing Specialists</td>
<td>Medium</td>
<td>4,990</td>
</tr>
<tr>
<td>Machinists</td>
<td>Medium</td>
<td>3,920</td>
</tr>
<tr>
<td>Industrial Machinery Mechanics</td>
<td>Medium</td>
<td>2,340</td>
</tr>
<tr>
<td>Dental Hygienists</td>
<td>Medium</td>
<td>2,130</td>
</tr>
<tr>
<td>Retail Salespersons</td>
<td>High</td>
<td>35,970</td>
</tr>
<tr>
<td>Laborers and Freight, Stock, and Material Movers, Hand</td>
<td>High</td>
<td>18,100</td>
</tr>
<tr>
<td>Construction Laborers</td>
<td>High</td>
<td>9,460</td>
</tr>
<tr>
<td>Operating Engineers and Other Construction Equipment Operators</td>
<td>High</td>
<td>5,220</td>
</tr>
<tr>
<td>Team Assemblers</td>
<td>High</td>
<td>4,380</td>
</tr>
<tr>
<td>Loan Officers</td>
<td>High</td>
<td>3,670</td>
</tr>
<tr>
<td>Pharmacy Technicians</td>
<td>High</td>
<td>3,250</td>
</tr>
<tr>
<td>Welders, Cutters, Solderers, and Brazers</td>
<td>High</td>
<td>3,160</td>
</tr>
<tr>
<td>Electrical and Electronic Equipment Assemblers</td>
<td>High</td>
<td>2,950</td>
</tr>
<tr>
<td>Inspectors, Testers, Sorters, Samplers, and Weighers</td>
<td>High</td>
<td>2,760</td>
</tr>
</tbody>
</table>

SOURCE: Inflection Point 2016, Allegheny Conference on Community Development
How can we adapt to the Forces of Change underway and take full advantage of the opportunities they create?

**Broadband**
Increased access to broadband could impact rural development, telecommuting, and infrastructure.

**Autonomous/Connected Vehicles**
Self-driving vehicles could impact safety, infrastructure, traffic, land use, and workforce.

**Mobility as a Service**
Uber, Lyft, etc. may change the way we travel and may reduce individual vehicle ownership.

**Additive Manufacturing**
3D printing can lead to efficiency, competitiveness, workforce development, and supply chain impacts.

**Artificial Intelligence**
Use of robotics has the potential to increase efficiency, impact jobs, and shift the local culture.
Creating Strategies
To Address Technology Forces of Change

The Technology Expert Resource Panel identified strategies for each Force of Change to address potential impacts and mitigate risks. Panelists discussed the need to adapt to ever-changing and evolving technology to stay competitive in the regional and national economy. Panelists identified a number of technology strategies:

• Expand the availability of broadband throughout the region and ensure rural areas do not get left behind.
• Assist in the deployment of connected/autonomous vehicles and offset negative impacts.
• Work with private ridesharing services to equitably provide increased mobility for all users.
• Prepare our current workforce for a future with greater integration of additive manufacturing and artificial intelligence.

Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. These were developed to aid in developing strategies to address impacts and mitigate risks.
Broadband Strategies

*That Impact Technology*

**Exploratory Scenario***

What If...there is unprecedented investment to bring next generation 5G Broadband Technology to the entire region.

*Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. It is not suggested that these scenarios will occur, only that a region may consider them as a “What If...” scenario.*
Strategy 1: Use Existing Transportation Corridors to Facilitate Delivery of Broadband Throughout the Region

Counties and municipalities should help promote reliable broadband access in rural communities and educate users on capabilities. New technology follows the highest demand and rural areas may be left behind without public intervention. This will help to address equitable access concerns in rural areas and allow rural residents to access work-from-home and remote positions. Furthermore, they should help integrate systems to include people who are not independently mobile. This network can also act as a backbone for a fiberoptic network in rural areas for autonomous vehicles to communicate.

Local and regional transportation agencies and local systems of government should include fiberoptic cable on highway construction/reconstruction projects to better adapt for the future and expand network capacity. Standards are still emerging and will continue to evolve as technology advances.

Regional assessments will be required in order to determine the threshold of service needed for public and private uses. Public/private partnerships will be crucial in the development and implementation of broadband installation. As 5G broadband services require small cell installations that are more closely spaced than the current tower installations, local municipalities should prepare for accommodating small cell locations through zoning, municipal actions, review processes, etc.

Partners for Implementation
PennDOT (including Design and Permit Divisions), telecommunications companies, municipalities
Autonomous/Connected Vehicle Strategies That Impact Technology

*Exploratory Scenario*

What If...connected and autonomous vehicles are the norm. The region’s roadways are more congested, requiring more maintenance of infrastructure, and impacting available revenues. Parking structures located near destinations become vacant as new parking storage areas are built away from activity centers.

*Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. It is not suggested that these scenarios will occur, only that a region may consider them as a “What If...” scenario.
Strategy 1: Deploy Appropriate Infrastructure to Facilitate Autonomous and Connected Vehicles

Appropriate infrastructure is required to facilitate autonomous and connected vehicles (AV/CV) technology. The region must work with PennDOT, local municipalities, and vehicle manufacturers to determine the infrastructure needs for AV/CV and identify and eliminate any technical barriers to the safe use of such vehicles. Projects and corridors should be prioritized based on safety, connectivity, and efficiency. Encourage partnerships between regional partners and local municipalities to develop associated land use design requirements/standards, such as curb space, drop-off points, etc. Coordinate public policy with funding, incentives and/or regulations, to advance deployment. Work with regional partners to develop a phasing process, which will be needed due to AV/CVs and non-AV/CVs sharing the roads for the foreseeable future.

Collaborate with PennDOT, research organizations, and local educational institutions to research best practices and educate the public on the implementation of AV/ACs.

Partners for Implementation
PennDOT, municipalities, universities, research organizations, vehicle manufacturers

Strategy 2: Offset Impacts of Autonomous and Connected Vehicles

AV/CV have many advantages. However, concerns exist regarding impacts to safety, land use, and other factors.

Partners for Implementation
Public sector, private sector, local, state and federal governments
Mobility as a Service Strategies
That Impact Technology

Exploratory Scenario*

What If...the region, its residents, and its business community fully embrace mobility as a service with the private sector playing a vital role. This lessens congestion, helps improve the region’s air quality and equitable access to all communities. It also connects people with job opportunities throughout the region, thereby alleviating tight local labor markets.

*Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. It is not suggested that these scenarios will occur, only that a region may consider them as a “What If...” scenario.
Strategy 1: Integrate Multiple Forms of Public/Private Transportation to Equitably Provide Increased Mobility For All Users

Increase mobility in the region by integrating multiple forms of public/private transportation which can result in increased mobility for all users. It also connects people with job opportunities throughout the region, thereby helping to alleviate tight local labor markets.

Encourage local municipalities and transit agencies to work to coordinate private services, such as Uber and Lyft, with traditional public transit to provide first and last mile services. Different types of services can be integrated and incentivized. The region must be able to adapt to future changes and work towards equitable solutions.

As public transit, AV/CV, ridesharing, and other technologies change our developed landscape. Local municipalities should be proactive in setting regulatory standards and ensuring that safety and best practices are being followed.

Partners for Implementation
Municipalities, counties, public transit agencies, private transportation providers
Additive Manufacturing Strategies That Impact Technology

Exploratory Scenario*

What If...additive manufacturing continues to grow in the region. This increases the region’s competitiveness in the manufacturing sector, requiring retraining of incumbent workers for additive manufacturing jobs.

*Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. It is not suggested that these scenarios will occur, only that a region may consider them as a “What If...” scenario.
Strategy 1: Retrain Workers to Accommodate Additive Manufacturing
While greater automation of manufacturing may lead to cost savings, it may also lead to employment loss and change in the educational requirements of the workforce. Encourage local public and trade schools to better prepare students for this changing field.

Partners for Implementation
Unions, employers, universities, public and trade schools, research organizations/Foundations

Strategy 2: Address Impacts of Supply Chain Restructuring
New and innovative 3D printing/additive manufacturing can impact the supply chain. While this technology would enable manufacturing to occur in small towns and underdeveloped areas, materials and products will need to be transported from different locations for manufacturing. It must be determined that if additive manufacturing would be more likely to occur in denser areas, what regulations would need to be developed, and how much it would impact current workforce numbers and ability.

Partners for Implementation
Municipalities, regional organizations, research organizations, existing manufacturers
Exploratory Scenario*
What If...there is a substantial increase in the use of automation and artificial intelligence, increasing efficiency, but negatively impacting many sectors of the workforce.

*Each exploratory scenario describes uncertain, but comprehensible, potential futures that may occur. It is not suggested that these scenarios will occur, only that a region may consider them as a “What If...” scenario.
Strategy 1: Retrain and Develop the Regional Workforce
As technology advances there may be a reduction in white collar jobs. Local unions, employers, and schools should partner to prepare for this potential industry shift. It will be important to build workforce expectations over time as industries evolve and mature. As a region, we can work to identify and address skills and geographic mismatches while considering tradeoffs (some jobs will be created while others are eliminated).

Providing flexible and easy to use funding for on the job training and teaching new computer skills will be important.

Partners for Implementation
Unions, employers, education institutions

Strategy 2: Identify how Transportation Agencies can Better Use Artificial Intelligence
Advances in artificial intelligence will enable local and regional transportation agencies to make intersections and routes more efficient and improve traffic flow for all users. Local, regional, and federal transportation agencies can better plan for the future and better prioritize resources. SPC, local municipalities, and transit agencies should coordinate with PennDOT and collaborate with local universities to help.

Artificial intelligence has the potential to help local transit/infrastructure authorities with potholes and sidewalk problems. Artificial intelligence in local infrastructure may be able to identify “who” is at the intersection (pedestrians, bicyclists, cars, other) and adjust timing of traffic lights to better improve traffic flow.

Additionally, facial recognition could be used for payment, transit preferences, and marketing/advertising for transit authorities. Artificial intelligence has the potential to transform our transportation system through improvements in access and efficiency.

Partners for Implementation
SPC, PennDOT, Federal Highway Administration, municipalities, counties, universities, public transit providers
Investing in our Future
Technology Strategies for Investment

During the Regional Plan Workshop, participants were asked to discuss potential draft strategies for the Forces of Change and identify investment levels for each of the draft strategies. This exercise helped to create a framework that could be used to evaluate and drive future evaluation of projects and investments.

Below are the investment strategy results for the Technology Forces of Change.

<table>
<thead>
<tr>
<th>Technology Forces of Change</th>
<th>Percent Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadband Strategies</td>
<td>31.9%</td>
</tr>
<tr>
<td>Use existing transportation corridors to facilitate delivery of broadband throughout the region.</td>
<td>31.9%</td>
</tr>
<tr>
<td>Automated / Connected Vehicles Strategies</td>
<td>11.3%</td>
</tr>
<tr>
<td>Deploy appropriate infrastructure to facilitate Automated and Connected Vehicles.</td>
<td>6.9%</td>
</tr>
<tr>
<td>Offset impacts of AV/CV on public sector revenue, congestion and local quality of life.</td>
<td>4.4%</td>
</tr>
<tr>
<td>Mobility as a Service Strategies</td>
<td>16.3%</td>
</tr>
<tr>
<td>Integrate multiple forms of public/private transportation to equitably provide increased mobility for all users.</td>
<td>16.3%</td>
</tr>
<tr>
<td>Additive Manufacturing Strategies</td>
<td>14.4%</td>
</tr>
<tr>
<td>Retrain workers as needed to accommodate Additive Manufacturing.</td>
<td>10.0%</td>
</tr>
<tr>
<td>Address impacts of supply chain restructuring.</td>
<td>4.4%</td>
</tr>
<tr>
<td>Artificial Intelligence Strategies</td>
<td>18.8%</td>
</tr>
<tr>
<td>Retrain/develop new workers as needed.</td>
<td>12.5%</td>
</tr>
<tr>
<td>Identify how transportation agencies can better use Artificial Intelligence.</td>
<td>6.3%</td>
</tr>
<tr>
<td>Other</td>
<td>7.5%</td>
</tr>
<tr>
<td>Not allocated or reserved for other</td>
<td>7.5%</td>
</tr>
</tbody>
</table>
Building the Vision

As discussed in this report, in developing Smart Moves for a Changing Region, SPC convened a series of Expert Resource Panel meetings to identify Forces of Change, weigh their potential impacts, and develop strategies to mitigate and/or optimize the forces. This information, coupled with public and partner input and feedback from SPC leadership, was organized into a set of three emerging themes that capture the most positive aspects of each strategy and focus them in a way that will result in a holistic long range plan for the region.

SPC is developing a plan that both provides a framework and makes significant investment to advance the most critical issues and projects facing the region. The emerging themes will be used in conjunction with performance metrics and other public input to evaluate the program of proposed projects and programs to be contained in the plan. This will ensure the projects and programs contained in the plan will work in concert to assist the Southwestern Pennsylvania region achieve its desired vision for the future.

The emerging regional vision is a world-class, well maintained, integrated transportation system that provides connected mobility for all, enables resilient communities and supports a globally competitive economy.

This vision means taking advantage of our considerable existing assets and developing, supporting and implementing projects that advance our progress. It means investing in regionally connected seamless public transportation that includes new transit investments in key corridors and networks. It means developing modern support infrastructure that prepares the region not just for current technological advances, but also strives to put the region years and decades ahead, by developing the next technology here in this region because we have the expertise in the region to make this happen. It means tackling climate change and taking care of our air and our water. This will allow us to work with many partners and dovetail this plan with other related plans and regional efforts of both public and private sector to advance the region.

The vision means working with partners in identifying and using the types of proven funding and financing arrangements that we will need to make that happen.

The vision will focus on the workforce needs of the region. It means attracting and growing our population by making the region a place where people want to come and stay. It means training our population not just for the jobs that exist but for the jobs we create through innovation and entrepreneurship, and making this region a leader in technology and innovation.

Technology and innovation can be much more than self-driving cars and artificial intelligence and it can work in rural as well as urban parts of the region. It will include innovative new farming techniques and technology deployment that will connect our entire region with high speed access to the internet to afford all our residents the opportunity to work from anywhere and connecting them to the global economic opportunities. The vision will recognize our assets and putting them to the best use for this region, and our residents.

The vision also means taking stewardship and care of the communities that are the foundation of this region, and environment that sustains us. This plan will focus community investment that both sustains our past and protects our future, while elevating the status of our communities throughout the region as desirable places to live and work.
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